

DOCUMENT RESUME

ED 160 465

SE 025 144

AUTHOR Himes, Dottie
TITLE Operation, Maintenance and Management of Wastewater Treatment Facilities: A Bibliography of Technical Documents.
INSTITUTION Environmental Protection Agency, Washington, D.C. Office of Water Programs.
PUB DATE May 78
NOTE 25p.
EDRS PRICE MF-\$0.83 HC-\$1.67 Plus Postage.
DESCRIPTORS *Annotated Bibliographies; Environment; Facilities; *Manuals; Pollution; Technical Education; *Waste Disposal; Water Pollution Control; Water Resources
IDENTIFIERS *Waste Water Treatment

ABSTRACT

This is an annotated bibliography of wastewater treatment manuals. Fourteen manuals are abstracted including: (1) A Planned Maintenance Management System for Municipal Wastewater Treatment Plants; (2) Anaerobic Sludge Digestion, Operations Manual; (3) Emergency Planning for Municipal Wastewater Treatment Facilities; (4) Estimating Laboratory Needs for Municipal Wastewater Treatment Facilities; and (5) Start-up of Municipal Wastewater Treatment Facilities. These manuals were prepared by operations specialists, and were developed in cooperation with EPA regional technical staff and State and local government personnel. Price lists and order forms are included. (BB)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *



Operation, Maintenance and Management of Wastewater Treatment Facilities

A Bibliography of Technical Documents

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

ED160465

SE 025 144

OPERATION, MAINTENANCE
AND MANAGEMENT OF
WASTEWATER TREATMENT
FACILITIES

A Bibliography of Technical
Documents

by

Dottie Himes
Program Analyst
(WH-596)

EPA Project Officer
Lehn J. Potter



May, 1978

Prepared for
Municipal Operations Branch
Office of Water Program Operations
U.S. Environmental Protection Agency
Washington, D.C. 20460

F O R E W O R D

The Municipal Operations Branch, under the direction of Mr. Lehn J. Potter, develops program strategies and related guidance documents on municipal wastewater treatment facilities in cooperation with the Environmental Protection Agency's ten Regions and the 50 States. A prime objective of the Branch is to assure adequate consideration of operation and maintenance characteristics in the planning, design and construction of new plants. The Branch is also responsible for action plans to assist States and municipalities in identifying and correcting wastewater treatment plant operational problems. Effective performance of these functions depends on a strong coordinated program involving Federal, State and local agencies, combined with the professional expertise of the consulting engineering communities.

A B S T R A C T

Efficient operations and maintenance saves money! Since 1956, nearly \$20 billion has been spent through EPA's Construction Grants Program to build new wastewater treatment facilities or to upgrade existing plants. If a plant fails to do the job it's supposed to, or deteriorates, these tax monies are wasted. There is conclusive evidence that one-third to one-half of existing plants are not operating effectively and efficiently.

Under the sponsorship of the Municipal Operations Branch, the Operation, Maintenance, and Management manuals described on the following pages, were prepared by operations specialists with years of in-plant experience. The manuals were developed in cooperation with EPA regional technical staff, as well as State and local governmental personnel. This Bibliography presents a summary description of the data included in the manuals. It will be noted that a broad spectrum of key information is covered, ranging from descriptions of process components and guidelines for plant start-up, to troubleshooting, preventive maintenance and laboratory testing procedures. Aerobic and Anaerobic Sludge Digestion are addressed, and include case histories of operational experiences and problem-solving techniques. The materials are designed to assist the operators, plant owners, consulting engineers and educators.

Copies of the manuals may be obtained by writing direct to the U.S. Government Printing Office or the National Technical Information Service. Appropriate data for direct orders are included as Appendices I and V respectively.

Questions relating to any of these documents should be directed to the appropriate EPA Regional Office. A listing of these mailing addresses is shown on the inside back cover of this Bibliography. Inquiries may also be submitted to the Municipal Operations Branch (WH-596), Office of Water Program Operations, United States Environmental Protection Agency, 401 "M" Street, S.W., Washington, D.C. 20460.

TABLE OF CONTENTS

	<u>Page</u>
Foreword	iii
Abstract	v
A Planned Maintenance Management System for Municipal Wastewater Treatment Plants.	1
Aspects of State-Wide Emergency Response Programs for Municipal Wastewater Treatment Facilities.	2
Aerobic Biological Wastewater Treatment Facilities, Process Control Manual.	3
Anaerobic Sludge Digestion, Operations Manual.	4
Considerations for Preparation of Operations and Maintenance Manuals.	5
Emergency Planning for Municipal Wastewater Treatment Facilities.	6
Estimating Laboratory Needs for Municipal Wastewater Treatment Facilities.	7
Estimating Staffing for Municipal Wastewater Treatment Facilities.	8
Maintenance Management Systems for Municipal Wastewater Facilities.	9
Package Treatment Plants, Operations Manual.	10
Performance Evaluation and Troubleshooting at Municipal Wastewater Treatment Facilities, Field Manual.	11
Sludge Handling and Conditioning, Operations Manual	12
Stabilization Ponds, Operations Manual.	13
Start-Up of Municipal Wastewater Treatment Facilities	14
	<u>Appendices</u>
Information for direct orders to:	
U.S. Government Printing Office.	I
National Technical Information Service.	thru
(with Order Forms)	VII
EPA Regional Office Addresses. . . (inside back cover)	

A PLANNED MAINTENANCE MANAGEMENT SYSTEM
FOR MUNICIPAL WASTEWATER TREATMENT PLANTS

This information was developed and successfully demonstrated as a Planned Maintenance Management System (PMMS) at the 18-mgd Lower Potomac Wastewater Treatment Plant of Fairfax County, Virginia. It outlines a model maintenance management program for wastewater treatment plants throughout the United States.

Specifics of maintenance needs on each item of plant equipment are provided and instructions on the maintenance of complex equipment are reduced to simple procedures. For each procedure, the system includes details of the methods, materials, tools and personnel required; schedules the task, and provides for data recording and feedback.

During the 12-month demonstration of the PMMS, a steady downward trend was noted in the frequency of malfunctions in various mechanical equipment. In many cases, the early detection of danger signs led to positive corrective action in preventing breakdowns.

This report describes the system in technical detail; thoroughly explains the installation of the system, including acceptance by the mechanics and coordination with plant operations, and outlines an application of the system to other wastewater treatment facilities.

ASPECTS OF STATE-WIDE EMERGENCY RESPONSE PROGRAMS
FOR MUNICIPAL WASTEWATER TREATMENT FACILITIES

The material provided in this document is designed to assist in the development of State emergency programs in responding to spills of raw or inadequately treated municipal wastewater. It emphasizes the legal aspects of spill reporting, the definition of a reportable spill and State-wide aspects of emergency response planning.

Preliminary steps in this work included a review of existing and proposed Federal statutes and current State water pollution control laws and regulations. Over 55 State and interstate agencies were asked to provide information on existing or future water pollution contingency plans; over 200 wastewater treatment facility managers provided data on emergency actions.

Each State response plan must, of course, be adapted to the local situation.

PROCESS CONTROL MANUAL FOR
AEROBIC BIOLOGICAL WASTEWATER TREATMENT FACILITIES

This document will provide an on-the-job reference for operators of activated sludge and trickling filter wastewater treatment plants. It will also assist operators in establishing process control techniques and in optimizing the performance of these two aerobic biological treatment systems.

The manual, presented in three major divisions, includes: The Activated Sludge Process; The Trickling Filter Process, and Appendices. Major subject matters are divided into the following sections: Troubleshooting; Process Control; Fundamentals; and Laboratory Control. These sections emphasize the fundamentals of operating and controlling aerobic biological treatment processes. Each section is presented in sufficient detail to allow the reader to use them independently.

OPERATIONS MANUAL
ANAEROBIC SLUDGE DIGESTION

Included in this manual are comments solicited from treatment plant operators throughout the country on the operation, control and troubleshooting of anaerobic sludge digesters. Major contributions are also included from scientists and engineers.

Case histories of operational experiences and problem-solving form a section of the publication which will be useful to plant operators, designers and engineers who are interested in digester operation and theory.

The subject of anaerobic digester operation in municipal wastewater treatment plants is presented by covering the area of troubleshooting, general operation, safety, start-up of units, basic theory, sampling, laboratory testing and other subjects relevant to day-to-day operations. The document is intended for plant operators who have anaerobic digesters as part of their total treatment process. It is structured so that each section is complete within itself and indexed for quick reference.

CONSIDERATIONS FOR PREPARATION
OF
OPERATION AND MAINTENANCE MANUALS

This material provides basic considerations for the preparation of complete and adequate municipal wastewater treatment plant operation and maintenance (O&M) manuals. Proper utilization of these guidelines will assist the user in complying with the eligibility requirements of EPA's Construction Grant Program.

Some of the information included was extracted from the appendix of the "Federal Guidelines for Design, Operation and Maintenance of Wastewater Treatment Facilities", (1970). Information was gathered from individuals experienced in the preparation of plant O&M manuals and data compiled from existing O&M manuals.

The document contains separate sections on each major topic recommended for inclusion in an O&M manual and detailed discussions on the type of information to be included. A suggested manual outline is presented for treatment plants; another for pumping stations and pipelines. The guidelines are not intended to present a rigid format; each manual must be adapted to the local situation.

EMERGENCY PLANNING FOR
MUNICIPAL WASTEWATER TREATMENT FACILITIES

Information provided in this document is designed to assist those responsible for developing comprehensive emergency operating procedures and systems for wastewater treatment facilities. It provides assistance for treatment plant staffs to use in explaining to local governing bodies the need for additional funds to remedy malfunctioning units at their plants. The material is also useful for municipal department heads and staff in developing plans suited to the peculiarities of their plants. It assists regulatory agencies in evaluating the emergency operating program sections of the O&M manuals.

Consulting engineers may use it as a guide for writing the emergency operating portion of an O&M manual for any municipal treatment system. Guidance is provided to ensure each plant's discharge of pollutants does not exceed the effluent limitations dictated by the facility's discharge permit.

ESTIMATING LABORATORY NEEDS FOR
MUNICIPAL WASTEWATER TREATMENT FACILITIES

Because treatment processes and combinations of processes vary widely, laboratory needs must be specifically tailored to each installation. This manual provides data to make possible the rough estimation of laboratory needs for municipal wastewater treatment plants. Criteria for physical facilities, staffing and laboratory services are included. Considerations for sampling and testing needs are presented for individual processes, and include the minimum and the best testing requirements. The testing programs are designed to meet the needs of each process.

Guidelines for equipment and supplies are divided into six categories: Major Equipment; Miscellaneous Equipment; Expendable Supplies, Glass and Plasticware; Test Kits; and Chemicals. The guidelines for Major Equipment and Chemicals are based on testing requirements, while the others are usually general and indicate items needed at any laboratory.

Estimates for staffing needs are given as the annual base man-hours for laboratories serving the several types of treatment facilities, and include methods for adjusting the number of man-hours for local conditions. The manual describes two ways of optimizing laboratory services: regional laboratories serving several facilities, and local laboratories serving both water and wastewater facilities.

ESTIMATING STAFFING FOR
MUNICIPAL WASTEWATER TREATMENT FACILITIES

Materials in this document are intended primarily for consulting engineers, plant management personnel, State regulatory agencies and the Environmental Protection Agency. The manual describes a four-step method for preparing staffing estimates for sewage treatment plants. It covers plants with capacities from 0.5 to 25 million gallons per day (mgd) of sewage, using primary, secondary and advanced treatment processes. The four steps described provide guidance to:

1. Develop, using a "Table of Adjustment for Local Conditions", factors for increasing or decreasing staffing needs relative to those required for an "average" plant.
2. Develop the staffing for an "average" plant using staffing curves showing annual man-hour needs. Items covered are:
 - a. Supervisory, clerical, laboratory and yard tasks based on plant design capacity.
 - b. Operation and maintenance work on the basis of both plant design capacity and types of process units or steps. The operation and maintenance man-hour needs for certain types of non-continuous processes on the basis of the time that the equipment for these processes is in operation.
3. Increase or decrease the annual manhour staffing for the above listed types of work using the factors taken from the "Table of Adjustment for Local Conditions".
4. Analyze and break-down staffing functions into specific tasks.

Note: Staffing estimates prepared according to this manual should not be used as rigid or final requirements. The ultimate decision on staff requirements for a particular plant should be determined by personnel familiar with similar plants under similar circumstances.

MAINTENANCE MANAGEMENT SYSTEMS FOR
MUNICIPAL WASTEWATER FACILITIES

Basic information furnished in this document was obtained from individuals experienced in maintenance management systems at various-sized facilities. Existing systems were reviewed at different municipalities, the private sector and defense establishments.

The manual includes a number of recommendations covering each of the basic elements required to develop an effective maintenance management system. These recommendations may be tailored or modified to meet specific equipment and plant type requirements. The procedures are comprehensive and will assist in the development of effective systems.

OPERATIONS MANUAL

PACKAGE TREATMENT PLANTS

Package treatment plants were originally designed to serve areas not easily connected to existing sewage treatment plants. Such areas include the subdivisions developed in the "fifties" and commercial establishments such as restaurants, motels and parks. More recently, package plants have increased in size so they can serve small municipalities. Many were installed with the concept the plants would operate with little or no operator attention. However, to meet today's more demanding pollution discharge regulations, these plants do require daily attention by a knowledgeable and conscientious operator thoroughly familiar with the plant. Materials included in this manual are designed to give the operator an increased knowledge of the basic principles in the effective operation of a package treatment plant.

The document is also directed to the plant owner and the design engineer. The owner may be either the actual purchaser of the plant, if privately owned, or the individual(s) or group responsible for making policy decisions concerning the treatment plant, such as a city council. The owner is responsible for enlarging the treatment plant when necessary, controlling sewer construction practices in the service area, keeping supplies at the plant and supervising the operator. Most importantly, the owner, in the final analysis, is legally and administratively responsible for the performance of the treatment plant. Detailed descriptions are provided, which outline the duties and responsibilities of the owner.

Also, for the engineer, this manual provides information that can be used wholly or in part with an O&M manual, prepared for a specific plant. It may be valuable to the consulting engineer in plant selection, by alluding to various design problems inherent in previous package plant installations.

FIELD MANUAL FOR
PERFORMANCE EVALUATION AND TROUBLESHOOTING AT
MUNICIPAL WASTEWATER TREATMENT FACILITIES

This manual is considered useful as a technical field guide or reference document for improving the performance of municipal wastewater treatment plants. A primary objective of the document is to provide a troubleshooting guide for identifying, analyzing and solving operating problems. It is also useful in EPA and State training courses for plant inspectors and performance evaluations. Consulting engineers, designers, plant operators, educators and students may also find the information useful.

A description is provided on procedures to evaluate the performance of treatment processes and equipment commonly used in municipal wastewater facilities. The procedures also cover other items related to the effective operation of municipal wastewater treatment plants. Troubleshooting and performance evaluation material is provided for each unit process commonly used in wastewater treatment facilities.

The style, language and format of the manual are directed to the level and technical knowledge of a technician having some experience in plant operation, design, inspection or performance evaluation.

OPERATIONS MANUAL
SLUDGE HANDLING AND CONDITIONING

This manual was initiated with the overall objective of providing guidance to assist in the proper operation and maintenance of various sludge processing, conditioning and disposal systems at wastewater treatment plants. Emphasis is placed on the establishment of good operational procedures, proper testing, effective measures for detection and correction of operational problems. The style and format of the manual is tailored to the needs of the potential user.

The processing and disposal systems presented in the document include those designed to treat various types of sludge generated from primary, secondary and chemical wastewater treatment processes. The principal sludge processes and unit operations are included such as sludge thickening, stabilization and conditioning, chemical and heat dewatering, heat drying, and ultimate disposal systems.

Step-by-step operation and maintenance procedures are presented for the various systems. Each section contains explicit instructions on process control procedures for detecting and correcting operational problems. Plant type and size are considered where applicable to operational procedures. Useful troubleshooting guides, solutions to design shortcomings and descriptions of design variations of particular processes are also included.

OPERATIONS MANUAL
STABILIZATION PONDS

Stabilization ponds for wastewater treatment were first used in the midwest for remote communities. They have since been used extensively in various parts of the country. In addition to domestic uses, ponds are now being used to treat various types of industrial wastes, including vegetable, oil refineries, slaughter houses, dairies, and rendering plants.

The manual is intended to:

A. Supplement the specific operation and maintenance manual prepared for municipal ponds.

B. Provide basic information on the theory of stabilization pond requirements for the entry-level operator.

C. Provide operation and maintenance suggestions for operators based on current pond experiences.

D. Provide a troubleshooting guide in handling various problems common to ponds.

The document is divided into six major divisions:

- I. The Basics
- II. Control Information
- III. Operation and Maintenance for Ponds
- IV. Troubleshooting for Ponds
- V. Safety
- VI. Appendices

START-UP OF MUNICIPAL
WASTEWATER TREATMENT FACILITIES

This document serves as a guide for establishing the initial outline for the operation of a new municipal wastewater treatment plant, a new addition to an existing plant or a change in the mode of a plant's operation.

Information is provided in preparing for actual treatment plant start-up, including: staffing, developing standard operating procedures; establishing procedures when construction is continued during start-up; dry and wetrun testing of equipment; on-site operator training; and safety training.

Start-up procedures are described for some of the more common pre-treatment and primary treatment units. Methods are also provided for specific secondary treatment processes of activated sludge, trickling filters, stabilization ponds and aerated lagoons, as well as sludge handling units and the anaerobic digestion process.

INFORMATION FOR DIRECT ORDERS
SUPERINTENDENT OF DOCUMENTS
U.S. GOVERNMENT PRINTING
OFFICE
WASHINGTON, D.C. 20401

<u>Title</u>	<u>G.P.O. Stock Number</u>	<u>Price</u>
A Planned Maintenance Management System for Municipal Wastewater Treatment Plants	5501-00756-6	\$ 2.75
Aspects of State-Wide Emergency Response Programs for Municipal Wastewater Treatment Facilities	055-001-01077-0	2.20
Aerobic Biological Wastewater Treatment Facilities, Process Control Manual	055-001-01071-1	4.75
Anaerobic Sludge Digestion, Operations Manual	055-001-01075-3	3.25
Considerations for Preparation of Oper- ation and Maintenance Manuals	5501-00644-6	3.10
Emergency Planning for Municipal Waste- water Treatment Facilities	5501-00778-7	1.25
Estimating Laboratory Needs for Munici- pal Wastewater Treatment Facilities	5501-00651-9	1.45
Estimating Staffing for Municipal Waste- Water Treatment Facilities	5501-00569-5	1.75
Maintenance Management Systems for Mu- nicipal Wastewater Facilities	5501-00762-1	1.60
Package Treatment Plants, Operations Manual	055-001-01072-9	2.50
Performance Evaluation and Trouble- Shooting at Municipal Wastewater Treatment Facilities, Field Manual	055-001-01078-8	5.50
Sludge Handling and Conditioning, Op- erations Manual	055-002-00167-0	5.75
Stabilization Ponds, Operations Manual	055-001-01076-1	2.30
Start-Up of Municipal Wastewater Treat- ment Facilities	5501-00763-9	1.40

ORDER FORM

To: *Superintendent of Documents, U.S. Government Printing
Office, Washington, D.C. 20402

Please send the following listed document(s):

<u>No. of Copies</u>	<u>Title of Document</u>	<u>G.P.O Stock Number</u>	<u>Cost per Copy</u>
_____	_____	_____	\$ _____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	TOTAL:	\$ _____

My (check/money order), made payable to the Superintendent
of Documents, is enclosed.

(NAME)

(FIRM)

(STREET ADDRESS)

(CITY)

(STATE)

(ZIP CODE)

NOTE: DO NOT SEND ORDER REQUESTS TO EPA
*All orders must be sent direct to the U.S. Government
Printing Office

Appendix III

INFORMATION FOR DIRECT ORDERS
NATIONAL TECHNICAL INFORMATION SERVICE
5285 PORT ROYAL ROAD, U.S. DEPT. OF COMMERCE
SPRINGFIELD, VIRGINIA 22161

<u>Title</u>	<u>PB Number</u>	<u>Price</u>	
		<u>Paper</u> <u>copy</u>	<u>Microfiche</u>
A Planned Maintenance Management System for Municipal Wastewater Treatment Plants	PB233111/AS	\$ 6.50	\$ 3.00
Aspects of State-Wide Emergency Response Programs for Municipal Wastewater Treatment Facilities	PB279551/AS	5.25	3.00
Aerobic Biological Wastewater Treatment Facilities	PB279474/AS	12.00	3.00
Anaerobic Sludge Digestion	PB250129/AS	9.00	3.00
Considerations for Preparation of Operation & Maintenance Manuals	PB227096/AS	9.50	3.00
Emergency Planning for Municipal Wastewater Treatment Facilities	PB256612/AS	6.00	3.00
Estimating Laboratory Needs for Municipal Wastewater Treatment Facilities	PB256613/AS	7.25	3.00
Estimating Staffing for Municipal Wastewater Treatment Facilities	PB227321/AS	6.00	3.00
Maintenance Management Systems for Municipal Wastewater Facilities	PB256611/AS	6.50	3.00
Package Treatment Plants	PB279444/AS	6.00	3.00
Performance Evaluation and Troubleshooting at Municipal Wastewater Treatment Facilities	PB279448/AS	13.25	3.00
Sludge Handling and Conditioning	PB279449/AS	12.50	3.00
Stabilization Ponds	PB279443/AS	6.00	3.00
Start-Up of Municipal Wastewater Treatment Facilities	PB256614/AS	6.00	3.00

Appendix V

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
84

1

0
3
0
0
0
0
0
0
0
0
0
0
0
0
0

:

•
•
•
•
•
•

•
•
•

EPA REGIONAL OFFICES

For the States of: CT, ME, MA,
NH, RI, VT

Operation and Maintenance Section
Municipal Facilities Branch
Water Division
EPA Region I
JFK Federal Building
Boston, MA. 02203

For the States of: NJ, NY, PR,
VI

Municipal Permits Section
EPA Region II
26 Federal Plaza
New York, NY. 10007

For the States of: DE, MD, PA,
VA, WV, DC

Municipal Permits Branch
EPA Region III
6th & Walnut Streets
Philadelphia, PA. 19108

For the States of: AL, FL, GA,
KY, MS, NC, SC, TN

Operation and Maintenance Unit
Technical Support Branch
Water Division
EPA Region IV
345 Courtland Street, NE
Atlanta, GA. 30308

For the States of IL, IN, MI,
MN, OH, WI

Operation and Maintenance/Municipal
Permits Section
Construction Grants Branch
Water Division
230 S. Dearborn Street
Chicago, IL. 60604

For the States of: AR, LA, NM,
OK, TX

Operation and Maintenance Chief
Municipal Facilities Branch
Water Division
1201 Elm Street
First International Building
Dallas, TX. 75270

For the States of: IA, KS, MO,
NB

Inspection Group
Technical Services Branch
Division of Surveillance & Analysis
25 Funston Road
Kansas City, KS. 66115

For the State of: CO, MT, ND,
SD, UT, WY

Operation and Maintenance Section
Control Technology Branch
Water Division
1860 Lincoln Street
Denver, CO. 80203

For the States of: AZ, CA, HI,
NV, American Samoa, Tr. Terr. of
Pacific Islands, Guam

Water Investigation Section
Technical Support Branch
Division of Surveillance & Analysis
215 Freemont Street
San Francisco, CA. 94105

For the States of: AK, ID, OR,
WA

Operation and Maintenance Unit
Municipal Section, Water Branch
Water Division
1200 Sixth Avenue
Seattle, WA. 98101